



Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report for Colrain Elementary School

What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

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Table 1: Public Water System (PWS) Information

<i>PWS Name</i>	Colrain Elementary School
<i>PWS Address</i>	22 Jackson Street
<i>City/Town</i>	Colrain, Massachusetts
<i>PWS ID Number</i>	1066004
<i>Local Contact</i>	Mr. Dann M. Emerson
<i>Phone Number</i>	413-624-3451

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	1066004-01G	146	445	High

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

Description of the Water System

The Colrain Elementary School (the school) is located approximately in the center of Colrain, on Route 112. Colrain is a small rural town in northwestern Massachusetts on the Vermont border. The total school student and staff population is approximately 235 people per day. Although there are two public water supply systems in Colrain, and a wastewater treatment facility, neither of water systems serves the school nor does the wastewater facility serve this area of town. Therefore, the school is served by one potable supply well (Well #1) and disposes of its wastewater through an on-site septic system.

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

The Zone I is the area immediately around the well where only activities associated with supplying water or non-threatening activities are allowed. The Interim Wellhead Protection Area (IWPA) is a larger area that potentially contributes water to the well. The IWPA is only an interim protection area until an actual Zone II contribution area is delineated; the actual area of contribution to the wellhead may be larger or smaller than the IWPA. The school's well has a Zone I protective radius of 146 feet and an IWPA protective radius of 445 feet. These protective radii were based on the withdrawal rate approved following a pumping test conducted on the well in 1995. The Zone I area for the well is not conforming to current DEP requirements. The Zone I area for Well #1 includes most of the school building and approximately 25 parking spaces. The IWPA includes the remaining sections of the school, the fuel oil underground storage tank (UST) and all of the septic system components including tanks and leachfield. Refer to the attached map that shows the Zone I and IWPA.

In 1995, the school was renovated and expanded. Site constraints prohibited development of a new source at the school and because the water quality for the existing well was not impaired by activities near the well, the DEP allowed the school to continue utilizing the existing well following a pumping test and analysis. During reconstruction, the septic system and the underground fuel oil storage tank were upgraded and located outside of the Zone I. The well is an 8-inch diameter, approximately 300 feet deep bedrock well, located within the basement of the oldest section of the school near the west wall.

The school is located in the narrow river valley of the East Branch of North River. Geologic mapping of the area indicates overburden deposits of less than 50 feet of sand with some amount of till over bedrock. The surficial deposits in the area are sand and

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Sources of Contaminants	Zone I	IWPA	Threat	Comments
Fuel Oil Storage	No	Yes	High	UST w/leak detection at school
Athletic fields	No	Yes	Moderate	Continue prohibiting the use of pesticides/fertilizers on school fields.
School facilities	Yes	Yes	Moderate	Limit road deicing usage, use BMPs for household hazardous materials and monitor parking areas and control stormwater
Low density residential and hobby farming/animals	No	Yes	Moderate	Septic systems, household hazardous materials, home heating fuel and manure management
Transportation Corridor/parking	No	Yes	Moderate	Jacksonville Road (Rt. 112) and school parking
Septic systems components	No	Yes	Moderate	School septic system in the IWPA
Transformers	No	Both	Low	Monitor transformers for potential leaks

-For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone II. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

gravel that was likely deposited during the recession of the glaciers some 14,000 to 18,000 years ago. Streams and rivers have reworked the stratified drift and deposited additional alluvium. The bedrock in the area is mapped as quartz mica schist with interbeds of quartzite and marble of the Conway Formation.

There is no evidence of a continuous, protective confining layer in the vicinity of the well. Wells drilled in these conditions are considered highly vulnerable to potential contamination from activities on the ground surface because there is no significant hydrogeologic barrier, such as clay, to prevent surface contamination from migrating into the aquifer. The water from the well does not require treatment prior to distribution. You may request additional information regarding the quality of the water, from the local contact listed in Table 1.

Please refer to the following section, attached maps of the Zone I and IWPA and Table 2 for additional assessment information.

2. Discussion of Land Uses in the Protection Areas

During the assessment, several land uses and activities were identified within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Non-conforming Zone I;**
2. **Underground storage tank;**
3. **School facilities and athletic fields; and**
4. **Transportation corridors and parking.**

There are several activities within the Zone I and IWPA that pose a significant threat to the water supply. The overall ranking of susceptibility to contamination for the well is high based on at least one high threat activity within the protection areas. Please refer to Table 2.

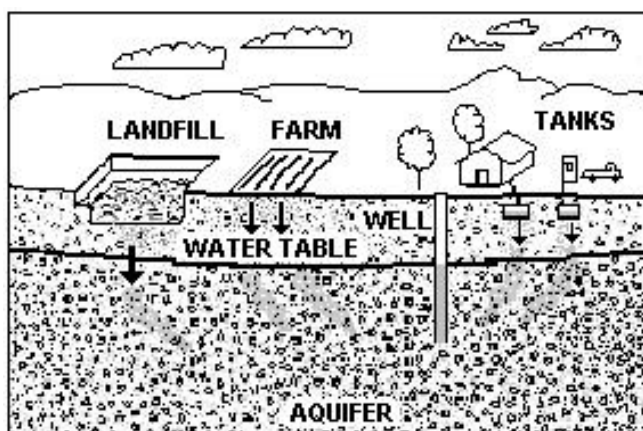


Figure 1: Example of how a well could become contaminated by different land uses and activities.

1. Non-conforming Zone I – The water supplier does not own or control the entire Zone I area. Systems not meeting DEP Zone I requirements for ownership or control, or non-conforming activities within Zone I must get DEP approval and address Zone I issues prior to increasing water use or modifying systems. During the 1995 school expansion, the DEP approved the use of the existing well due to site constraints and good water quality from the existing well.

Zone I Recommendations:

- ✓ Prohibit any additional activities within Zone I and, where feasible, remove non-conforming activities within the Zone I areas.
- ✓ Use Best Management Practices for handling household hazardous chemicals and site maintenance.
- ✓ Monitor all fuel oil deliveries and parking areas.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Prohibit the use or storage of any hazardous materials near the well. Inspect the well regularly to ensure the cap is secure.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

For More Information:

Contact Catherine V. Skiba in DEP's Springfield Regional Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/ including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, town boards, the town library and the local media.

2. Underground fuel oil storage – There is one fuel oil UST located within the IWPA. If managed improperly, fuel oil tanks and their associated fuel lines can be a potential source of contamination due to leaks or spills of the materials they store. The fuel lines are sleeved and graded to drain back to the tank.

Recommendation:

- ✓ Any modifications to the tank must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding ASTs and USTs.
- ✓ Monitor all activities associated with the fuel oil especially delivery.
- ✓ Have spill containment/absorbent materials available on-site.

3. School facilities and athletic fields – Elementary schools generally use only household type hazardous materials. There are state and federal controls on some activities and products used at schools to promote "healthy schools". All of the school's facilities are located within the Zone I or IWPA of the well. Potential exists for contamination of the well by onsite use of cleaning materials, petroleum from lawn equipment, fertilizers, and pesticides. Storm drains in the parking areas at the school drain directly into the ground.

Recommendations:

- ✓ Continue the use of Best Management Practices for all activities at the school and at the athletic fields across the street. Consider drought resistant grasses and/or low release nutrient fertilizers in the IWPA, as required.
- ✓ Investigate Integrated Pest Management and Best Management Practices within the IWPA as necessary.
- ✓ Use secondary containment as necessary for any petroleum products kept for maintenance and lawn care equipment.
- ✓ Use Best Management Practices for handling treatment chemicals and vehicles used to access the area. Do not use or store pesticides, fertilizers or deicing materials within Zone I.
- ✓ Review the handling of laboratory wastes to determine if a tight tank is appropriate.
- ✓ Review your emergency response plan regarding accidental releases within the area. Ensure that emergency responders in town are aware of the locations of your resource areas.
- ✓ Refer to the Massachusetts Public Health Association's Healthy Schools website online at http://www.mphaweb.org/pol_schools.html for additional information.

4. Residential Land Use – There are a few rural residences within the IWPA protection area. One home adjacent to the school has horses (hobby farming). There are also residences across the river from the school that are within the IWPA. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems leach to the ground. If septic systems fail or are not properly maintained they could be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground and streams. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automobile leaks,

maintenance, washing, or accidents. Visit the Nonpoint Source pollution web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

Residential Land Use Recommendations:

- V Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- V Work with hobby farmers by supplying them with information about protecting their own wells and the public water supply by encouraging the use of BMPs. Refer to <http://www.state.ma.us/dep/brp/dws/dwspubs.htm> and <http://www.state.ma.us/dep/consumer/animal.htm#dwqual> for additional resources.

5. Transportation corridor – Route 112 along with the access and parking areas for the facility are located within the Zone I and IWPA. Accidents and normal use and maintenance of roads pose a potential threat to water quality. Catch basins transport stormwater from roadways and adjacent properties to the ground, streams, rivers or reservoir. As flowing stormwater travels, it picks up de-icing materials, petroleum chemicals and other debris on roads and contaminants from streets and lawns. Common potential contaminants in stormwater originate from automotive leaks, automobile maintenance and car washing, accidental spills as well as waste from wildlife and pets. Parking lot storm runoff is discharged through infiltration catch basins.

Recommendations:

- V Prepare an Emergency Response Plan that includes coordination among the emergency responders to be sure they are aware of the location of your well.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will further reduce the well’s susceptibility to contamination. The DEP commends the effort shown in current protection practices of not using pesticides and fertilizers in the Zone I and the relocation of the UST and septic system during reconstruction.

Please review and adopt the key recommendations listed above and as follows:

Priority Recommendations:

- V Monitor all activities associated with the fuel oil, especially delivery.

Zone I and IWPA:

- V Prohibit any new non-water supply activities from Zone I.
- V Conduct regular inspections of the Zone I and IWPA.
- V Consider relocating the well if water quality is impacted by activities near the well.
- V Post drinking water supply signs in key locations, such as, along the access road and in the parking areas but away from the well.
- V Provide information to staff and pertinent school organizations about the potential hazards of household chemicals, lawn care chemicals and fertilizers.
- V Use Best Management Practices (BMPs) for the use of petroleum products, lawn care products, pesticides and household hazardous waste.

Training and Education/Facilities Management:

- V Incorporate groundwater education into school curriculum (K-6 curricula available; contact DEP for copies).
- V Staff should be instructed on the proper disposal of spent household chemicals. Include custodial staff, groundskeepers, and the certified operator.
- V In order to participate in a Community Hazardous Waste Pick-up day, the school must be registered as a Very Small Quantity Generator. The school is currently not registered as a generator of hazardous waste or waste oil. Review the enclosed document “A SUMMARY OF REQUIREMENTS FOR SMALL QUANTITY GENERATORS OF HAZARDOUS WASTE” and consider registering to participate if it is appropriate.

Planning:

- V Work with local officials to develop an Aquifer Protection District and Bylaws that includes the school well’s IWPA along with other water supply protection areas in town and to assist you in continued protection of the water supply.

- V Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- V Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts.
- V Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Funding:

The Department's Wellhead Grant Protection Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". If funds are available, the Department posts a new Request for Response (RFR), grant application form. Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" on the MA DEP website at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply (PWS) Protection Areas
- Recommended Source Protection Measures Fact Sheet